Localization-delocalization transition in interacting one-dimensional fermion systems: H. Fukuyama, ISSP, Tokyo Univ.

Electrons in one-dimensional disordered systems exhibit Anderson localization in the absence of mutual interactions. However the transition is possible between localized and delocalized state as the interaction is turned on.[1] In this paper such interplay between Anderson localization and interactions has been examined[2] for spin dependent Tomonaga model[3] based on the phase Hamiltonian derived by the bosonization of the fermion field.[4] The problem is the extention of the classical impurity pinning of the charge density wave[5] to that of quantum systems with phase variables of not only charge but also spin. The critical value of the interaction constant has been derived by the use of selfconsistent-harmonic approximation to the nonlinearity. 1) W. Apel, J. Phys. C. **15** (1982) 1973; W. Apel and T.M Rice, Phys. Rev. **B26** (1982) 7063, 2) Y. Suzumura and H. Fukuyama, J. Phys. Soc. Jpn. **52** (1983) 2870, 3) For review, J. Solyom, Adv. Phys. **28** (1979) 201, 4) Y. Suzumura, Prog. Theor. Phys. **61** (1979) 1, 5) H. Fukuyama and P.A. Lee, Phys. Rev. **B17** (1978) 535.